ABSTRACT OF THE DISCLOSURE

[00062] Process control of a furnace-type carbon black reactor can be improved if certain process conditions are maintained. Principal among these are the calculated combustion gas temperature and the percentage or absolute amount of oxygen present within the combustion gases at a point just upstream of the feedstock oil injection point. Desired conditions can be obtained by adjusting the amount of oxygen enrichment in the oxidizer stream. A computer-based, mathematical model of a carbon black process indicates that such process control would enable the use of flue gas as fuel for a furnace-type reactor and that the oxygen enrichment of the oxidizer stream needed to obtain the same combustion gas temperature and oxygen content as that produced with hydrocarbon fuel provides the same heat input rate above an arbitrary datum such as 77°F at that combustion temperature and about the same combustion gas volume at the feedstock oil injection point as that obtained with a conventional hydrocarbon fuel.